

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Appln. Of: CERVANTES)
Serial Number: 10/719,488)
Filed: November 20, 2003)
For: APPARATUS AND METHOD TO CONTROL ACCESS . . .)
Group: 2186)
Examiner: Dare, Ryan DOCKET TUC920030138US1)

Board of Patent Appeals and Interference
US Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Appellants' Brief On Appeal

This Brief is being filed in support of Appellants' Appeal from the Primary Examiner to the Board of Patent Appeals and Interferences. Appellants timely filed a Notice of Appeal on November 6, 2007. In the event there are any fee deficiencies or additional fees are payable, please charge them, or credit an overpayment, to our Deposit Account No. 502262.

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REAL PARTIES IN INTEREST

The real party in interest in this appeal is International Business Machines Corporation,
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RELATED APPEALS AND INTERFERENCES

To the best of the knowledge of the undersigned attorney and the Appellants, no other appeals or interferences exist which will affect or be directly affected, or have a bearing on, the instant appeal.

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STATUS OF CLAIMS

Claims 1-26 stand rejected and are on appeal. The claims on appeal are set forth in

CLAIMS APPENDIX A.

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STATUS OF THE AMENDMENTS

An Office Action comprising a final rejection of all pending claims was mailed on August 9, 2007. No amendments were filed thereafter.

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SUMMARY OF THE CLAIMED SUBJECT MATTER

Claim 1 recites a method to control access to logical volumes disposed in an information storage and retrieval system. Claim 1 further recites providing an information storage and retrieval system comprising a plurality of logical volumes. Support can be found in the Specification on Page 15 at Lines 1-4, and in FIG. 3 at step 310. Claim 1 further recites that [the information storage and retrieval system is owned by a storage system owner. Support can be found in the Specification on Page 14 at Lines 10-12.

Claim 1 further recites providing a plurality of host computers, wherein each of the plurality of host computers is capable of communicating with the information storage and retrieval system. Support can be found in the Specification on Page 15 at Lines 5-7, and in FIG. 3 at step 320. Claim 1 further recites that at least two of the plurality of host computers are owned by different host computer owners, and that those different host computer owners differ from the storage system owner. Support can be found in the Specification on Page 14 at Lines 1-18.

Claim 1 further recites forming by the storage system owner (N) host computer groups, wherein (N) is greater than or equal to 1. Support can be found in the Specification on Page 15 at Lines 8-13, and in FIG. 3 at step 330. Claim 1 further recites assigning by the storage system owner each of the plurality of host computers to one of the (N) host computer groups. Support can be found in the Specification on Page 16 at Lines 11-15.

Claim 1 further recites forming by the storage system owner (N) logical volume groups. Support can be found in the Specification on Page 16 at Lines 18-20, and in FIG. 3 at step 360. Claim 1 further recites assigning by the storage system owner one or more of the plurality of

logical volumes to the (i)th logical volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N). Support can be found in the Specification on Page 17 at Lines 1-5, and in FIG. 3 at step 370. Claim 1 further recites that any logical volumes not assigned to any of the (N) logical volume groups remain unassigned. Support can be found in the Specification on Page 17 at Lines 7-9.

Claim 1 further recites maintaining a database associating the (i)th host computer group with the (i)th logical volume group. Support can be found in the Specification on Page 17 at Lines 10-15, and in FIG. 3 at step 380. Claim 1 further recites permitting each of the one or more host computers assigned to the (i)th host computer group to access each logical volume comprising the (i)th logical volume group. Support can be found in the Specification on Page 3 at Lines 1-4.

Claim 1 further recites that each of the plurality of host computers assigned to an (i)th host computer group is not assigned to any other of the (N) host computer groups. Support can be found in the Specification on Page 2 at Lines 14-17. Claim 1 further recites that each of the logical volumes assigned to the (i)th logical volume group is not assigned to any other of the (N) logical volume groups. Support can be found in the Specification on Page 2 at Lines 18-21.

Claim 11 recites an information storage and retrieval system comprising a computer readable medium having computer readable program code disposed therein to control access to logical volumes disposed therein. Support can be found in the Specification on Page 22 at Lines 19-22, and on Page 23 at Lines 4-9. Claim 11 further recites that the information storage and retrieval system is owned by a storage system owner. Support can be found in the

Specification on Page 14 at Lines 10-12. Claim 11 further recites that the information storage and retrieval system comprises a plurality of logical volumes. Support can be found in the Specification on Page 11 at Lines 13-16, and on Page 15 at Lines 1-4. Claim 11 further recites that a plurality of host computers is capable of communicating with the information storage and retrieval system. Support can be found in the Specification on Page 15 at Lines 5-7, and in FIGs. 2A and 2B. Claim 11 further recites that at least two of the plurality of host computers are owned by different host computer owners, and wherein those different host computer owners differ from the storage system owner. Support can be found in the Specification on Page 14 at Lines 14-18.

Claim 11 further recites forming (N) host computer groups, wherein (N) is greater than or equal to 1. Support can be found in the Specification on Page 15 at Lines 8-13, and in FIG. 3 at step 330. Claim 11 further recites assigning each of the plurality of host computers to one of the (N) host computer groups. Support can be found in the Specification on Page 16 at Lines 11-15.

Claim 11 further recites forming (N) logical volume groups. Support can be found in the Specification on Page 16 at Lines 18-20, and in FIG. 3 at step 360. Claim 11 further recites assigning one or more of the plurality of logical volumes to the (i)th logical volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N). Support can be found in the Specification on Page 17 at Lines 1-5, and in FIG. 3 at step 370. Claim 11 further recites that any logical volumes not assigned to any of the (N) logical volume groups remain unassigned. Support can be found in the Specification on Page 17 at Lines 7-9.

Claim 11 further recites maintaining a database associating the (i)th host computer

group with the (i)th logical volume group. Support can be found in the Specification on Page 17 at Lines 10-15, and in FIG. 3 at step 380. Claim 11 further recites permitting each of the one or more host computers assigned to the (i)th host computer group to access each logical volume comprising the (i)th logical volume group. Support can be found in the Specification on Page 3 at Lines 1-4.

Claim 11 further recites that each of the plurality of host computers assigned to an (i)th host computer group is not assigned to any other of the (N) host computer groups. Support can be found in the Specification on Page 2 at Lines 14-17. Claim 11 further recites that each of the logical volumes assigned to the (i)th logical volume group is not assigned to any other of the (N) logical volume groups. Support can be found in the Specification on Page 2 at Lines 18-21.

Claim 21 recites a computer program product embodied in an information storage medium, the computer program product being usable with a programmable computer processor to control access to logical volumes disposed in an information storage and retrieval system. Support can be found in the Specification on Page 23 at Lines 1-9.

Claim 21 further recites that the information storage and retrieval system is owned by a storage system owner. Support can be found in the Specification on Page 14 at Lines 10-12. Claim 21 further recites that the information storage and retrieval system comprises a plurality of logical volumes. Support can be found in the Specification on Page 11 at Lines 13-16, and on Page 15 at Lines 1-4. Claim 21 further recites that a plurality of host computers is capable of communicating with the information storage and retrieval system. Support can be found in the Specification on Page 15 at Lines 5-7, and in FIGs. 2A and 2B. Claim 21 further recites

that at least two of the plurality of host computers are owned by different host computer owners, and wherein those different host computer owners differ from the storage system owner. Support can be found in the Specification on Page 14 at Lines 14-18.

Claim 21 further recites computer readable program code which causes the programmable computer processor to form (N) host computer groups, wherein (N) is greater than or equal to 1. Support can be found in the Specification on Page 15 at Lines 8-13, and in FIG. 3 at step 330. Claim 21 further recites computer readable program code which causes the programmable computer processor to assign each of the plurality of host computers to one of the (N) host computer groups. Support can be found in the Specification on Page 16 at Lines 11-15.

Claim 21 further recites computer readable program code which causes the programmable computer processor to form (N) logical volume groups. Support can be found in the Specification on Page 16 at Lines 18-20, and in FIG. 3 at step 360. Claim 21 further recites computer readable program code which causes the programmable computer processor to assign one or more of the plurality of logical volumes to the (i)th logical volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N). Support can be found in the Specification on Page 17 at Lines 1-5, and in FIG. 3 at step 370. Claim 21 further recites that any logical volumes not assigned to any of the (N) logical volume groups remain unassigned. Support can be found in the Specification on Page 17 at Lines 7-9.

Claim 21 further recites computer readable program code which causes the programmable computer processor to maintain a database associating the (i)th host computer group with the (i)th logical volume group. Support can be found in the Specification on Page

17 at Lines 10-15, and in FIG. 3 at step 380. Claim 21 further recites computer readable program code which causes the programmable computer processor to permit each of the one or more host computers assigned to the (i)th host computer group to access each logical volume comprising the (i)th logical volume group. Support can be found in the Specification on Page 3 at Lines 1-4.

Claim 21 further recites that each of the plurality of host computers assigned to (i)th host computer group is not assigned to any other of the (N) host computer groups. Support can be found in the Specification on Page 2 at Lines 14-17. Claim 11 further recites that each of the logical volumes assigned to the (i)th logical volume group is not assigned to any other of the (N) logical volume groups. Support can be found in the Specification on Page 2 at Lines 18-21.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The issues presented on appeal are:

1. Whether claims 1-7 and 10 are unpatentable under 35 U.S.C. § 103(a) over Shinohara et al. (U.S. Pat. No. 7,103,665) in view of Krehbiel et al. et al (U.S. Pub. No. 2003/0217305).
2. Whether claims 8 and 9 are unpatentable under 35 U.S.C. § 103(a) over Shinohara et al. in view of Krehbiel et al. et al and Burton et al. (U.S. Pat. No. 6,633,962).
3. Whether claims 11-17 and 20 are unpatentable under 35 U.S.C. § 103(a) over Shinohara et al. in view of Krehbiel et al. et al.
4. Whether claims 18 and 19 are unpatentable under 35 U.S.C. § 103(a) over Shinohara et al. in view of Krehbiel et al. et al and Burton et al.
5. Whether claims 21-26 are unpatentable under 35 U.S.C. § 103(a) over Shinohara et al. in view of Krehbiel et al. et al.

ARGUMENTS ON APPEAL

I. THE EXAMINER IMPROPERLY REJECTS CLAIMS 1-7, AND 10, UNDER 35 USC § 103(a) AS BEING UNPATENTABLE OVER SHINOHARA ET AL. IN VIEW OF KREHBIEL ET AL.

A. *The Combined Teachings Of Shinohara Et Al. And Krehbiel Et Al. Fail To Teach Or Suggest All The Elements Of Appellants' Claim 1*

Shinohara et al. teach a resources management program on a computer network having a plurality of storage systems of different types, where that program converts a resources allocation request into a setup request appropriate to the network or storage system. Col. 2 at Lines 10-15. Shinohara et al. nowhere teach a method comprising the steps of, *inter alia*, providing a plurality of logical volumes, forming by a storage system owner (N) logical volume groups, assigning one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned. The Examiner acknowledges that "Shinohara fails to teach leaving logical volumes unassigned from the logical volume groups." August 9, 2007 Office Action at Page 4.

Krehbiel et al. fail to cure the deficiencies of Shinohara et al. Krehbiel et al. teach a data processing system that comprises multiple primary storage devices, and at least one unused, unassigned storage device. Paragraph [0021]. If one of the primary storage devices fails, then an unassigned storage device is selected as a replacement drive for the failed storage device. Paragraph [0021].

Krehbiel et al. nowhere even mentions forming logical volume groups or host computer groups. This being the case, Krehbiel et al. nowhere teach a method comprising the steps of, *inter alia*, providing a plurality of logical volumes, forming by a storage system owner (N)

logical volume groups, assigning one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), and where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned.

In *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 167 L. Ed. 2d 705 (2007), the Supreme Court held that the obviousness analysis of *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966), controls an obviousness inquiry. The *Graham* obviousness factors include “the scope and content of the prior art” and the “differences between the prior art and the claims”. *KSR*, 127 S. Ct. at 1734 (quoting *Graham*, 383 U.S. at 17-18).

Shinohara et al. and Krehbiel et al., singly or in combination, fail to teach a method that comprises providing a plurality of logical volumes, forming by a storage system owner (N) logical volume groups, assigning one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), and where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants’ claim 1.

Shinohara et al. actually teach away from the Appellants’ claim 1. “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); see *KSR*, 127 S. Ct. at 1739-40 (explaining that when the prior art teaches away from a combination, that combination is more likely to be nonobvious).

Shinohara et al. teach a method that provides a plurality of logical volumes and assigns each of the logical volumes to some logical volume group. For example, in FIG. 2 Shinohara et al. teach a system comprising four logical volumes, including logical volumes LV0 and LV1 in storage system 0, wherein those logical volumes are designated LV00 and LV01 in FIG. 6, and logical volumes LV0 and LV1 in storage system 1, wherein in FIG. 6 those logical volumes are designated LV10 and LV11.

In FIG. 6, Shinohara et al. teach assigning logical volumes LV00, LV01, and LV10 to Logical Volume Group 0, and assigning logical volume LV11 to Logical Volume Group 1. Shinohara et al. nowhere teach or suggest a method which provides a plurality of logical volumes, wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants' claim 1.

One of ordinary skill in the art following the teachings of Shinohara et al. would be motivated to provide a plurality of logical volumes, and assign each of those logical volumes to some logical volume group. On the other hand, one of ordinary skill in the art following the teachings of Shinohara et al. would find no motivation to provide a plurality of logical volumes and (N) logical volume groups, wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants' claim 1.

Appellants respectfully submit claim 1 is patentable over the combined teachings of Shinohara et al. and Krehbiel et al.

B. The Combined Teachings Of Shinohara Et Al. And Krehbiel Et Al. Fail To Teach Or Suggest All The Elements Of Appellants' Claims 2-7 And 10

Claims 2-7 and 10 depend, directly or indirectly, from claim 1. Under 35 U.S.C. § 112, fourth paragraph, “a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.” “If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.” MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988). Appellants respectfully submit that claims 2-7 and 10 are patentable over the combined teachings of Shinohara et al. and Krehbiel et al.

II. THE EXAMINER IMPROPERLY REJECTS CLAIMS 8 AND 9 UNDER 35 USC § 103(a) AS BEING UNPATENTABLE OVER SHINOHARA ET AL. IN VIEW OF KREHBIEL ET AL. AND BURTON ET AL.

Claims 8 and 9 depend from claim 1. Under 35 U.S.C. § 112, fourth paragraph, “a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.” This being the case, claims 8 and 9 recite, *inter alia*, that any logical volumes not assigned to any of the (N) logical volume groups remain unassigned. Claims 8 and 9 further recite, *inter alia*, that each host computer is assigned to one of the (N) host computer groups.

As a preliminary matter, Appellants respectfully submit that the combination of Shinohara et al. and Burton et al. is improper. “There is no suggestion to combine, however, if a reference teaches away from its combination with another source.” *Tec Air Inc. v. Denso Manufacturing Michigan Inc.*, 52 USPQ2d 1294, 1298 (Fed.Cir. 1999). Burton et al. teaches away from Shinohara et al. Shinohara et al. teach that each host computer is assigned to one of a plurality of host computer groups. In FIG. 2, Shinohara et al. show three host computers. In

FIGs. 3, 4, and 5, Shinohara et al. show each of those three host computers assigned to either host group 0 or host group 1. In contrast, Burton et al. teach that “ a host can be in zero or more cluster groups.” Col. 4 at Lines 65-66 (emphasis added).

Neither Shinohara et al. nor Burton et al., singly or in combination, teach or suggest providing a plurality of host computers, assigning each of the plurality of host computers to one of (N) host computer groups, providing a plurality of logical volumes, forming (N) logical volume groups, wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited by Appellants’ claims 8 and 9.

For the reasons set forth above, Shinohara et al. teaches away from Appellants’ claims 8 and 9 because Shinohara et al. teach that each logical volumes is assigned to some logical volume group. Burton et al. teaches away from Appellants’ claims 8 and 9 because Burton et al. teach that a host computer need not be assigned to any host computer group.

Appellants respectfully submit that claims 8 and 9 are patentable over the combined teachings of Shinohara et al., Krehbiel et al., and Burton et al.

III. THE EXAMINER IMPROPERLY REJECTS CLAIMS 11-17 AND 20 UNDER 35 USC § 103(a) AS BEING UNPATENTABLE OVER SHINOHARA ET AL. IN VIEW OF KREHBIEL ET AL.

A. The Combined Teachings Of Shinohara Et Al. And Krehbiel Et Al. Fail To Teach Or Suggest All The Elements Of Appellants’ Claim 11

Shinohara et al. teach a resources management program on a computer network having a plurality of storage systems of different types, where that program converts a resources allocation request into a setup request appropriate to the network or storage system. Col. 2 at Lines 10-15. Shinohara et al. nowhere teach an information storage and retrieval system comprising computer readable program code to implement a method, wherein the method

comprises providing a plurality of logical volumes, forming by a storage system owner (N) logical volume groups, assigning one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited by Appellants' claim 11. The Examiner acknowledges that "Shinohara fails to teach leaving logical volumes unassigned from the logical volume groups." August 9, 2007 Office Action at Page 4.

Krehbiel et al. fail to cure the deficiencies of Shinohara et al. Krehbiel et al. teach a data processing system that comprises multiple primary storage devices, and at least one unused, unassigned storage device. If one of the primary storage devices fails, then an unassigned storage device is selected as a replacement drive for the failed storage device. Paragraph [0021].

Krehbiel et al. nowhere even mentions forming logical volume groups. This being the case, Krehbiel et al. nowhere teach an information storage and retrieval system comprising computer readable program code to implement a method, wherein the method comprises providing a plurality of logical volumes, forming by a storage system owner (N) logical volume groups, assigning one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), and where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned.

In *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 167 L. Ed. 2d 705 (2007), the Supreme Court held that the obviousness analysis of *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966), controls an obviousness inquiry. The

Graham obviousness factors include “the scope and content of the prior art” and the “differences between the prior art and the claims”. *KSR*, 127 S. Ct. at 1734 (quoting *Graham*, 383 U.S. at 17-18).

Shinohara et al. and Krehbiel et al., singly or in combination, fail to teach a method that comprises providing a plurality of logical volumes, forming by a storage system owner (N) logical volume groups, assigning one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), and where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants’ claim 11.

Shinohara et al. actually teach away from the Appellants’ claim 11. “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); see *KSR*, 127 S. Ct. at 1739-40 (explaining that when the prior art teaches away from a combination, that combination is more likely to be nonobvious).

Shinohara et al. teach an apparatus implementing a method that provides a plurality of logical volumes and assigns each logical volume to some logical volume group. For example, in FIG. 2 Shinohara et al. teach a system comprising four logical volumes, including logical volumes LV0 and LV1 in storage system 0, wherein those logical volumes are designated LV00 and LV01 in FIG. 6, and logical volumes LV0 and LV1 in storage system 1, wherein in FIG. 6 those logical volumes are designated LV10 and LV11.

In FIG. 6, Shinohara et al. teach assigning logical volumes LV00, LV01, and LV10 to

Logical Volume Group 0, and assigning logical volume LV11 to Logical Volume Group 1. Shinohara et al. nowhere teach or suggest a method which provides a plurality of logical volumes, wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants' claim 11.

One of ordinary skill in the art following the teachings of Shinohara et al. would be motivated to provide a plurality of logical volumes, and assign each of those logical volumes to some logical volume group. On the other hand, one of ordinary skill in the art following the teachings of Shinohara et al. would find no motivation to provide a plurality of logical volumes and (N) logical volume groups, wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants' claim 11.

Appellants respectfully submit claim 11 is patentable over the combined teachings of Shinohara et al. and Krehbiel et al.

B. The Combined Teachings Of Shinohara Et Al. And Krehbiel Et Al. Fail To Teach Or Suggest All The Elements Of Appellants' Claims 12-17 And 20

Claims 12-17 and 20 depend, directly or indirectly, from claim 11. Under 35 U.S.C. § 112, fourth paragraph, "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988). Appellants respectfully submit that claims 12-17 and 20 are patentable over the combined teachings of Shinohara et al. and Krehbiel et al.

IV. THE EXAMINER IMPROPERLY REJECTS CLAIMS 18 AND 19 UNDER 35 USC § 103(a) AS BEING UNPATENTABLE OVER SHINOHARA ET AL. IN VIEW OF KREHBIEL ET AL. AND BURTON ET AL.

Claims 18 and 19 depend from claim 11. Under 35 U.S.C. § 112, fourth paragraph, “a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.” This being the case, claims 18 and 19 recite, *inter alia*, that any logical volumes not assigned to any of the (N) logical volume groups remain unassigned. Claims 18 and 19 further recite, *inter alia*, that each host computer is assigned to one of the (N) host computer groups.

As a preliminary matter, Appellants respectfully submit that the combination of Shinohara et al. and Burton et al. is improper. “There is no suggestion to combine, however, if a reference teaches away from its combination with another source.” *Tec Air Inc. v. Denso Manufacturing Michigan Inc.*, 52 USPQ2d 1294, 1298 (Fed.Cir. 1999). Burton et al. teaches away from Shinohara et al. Shinohara et al. teach that each host computer is assigned to some host computer group. In FIG. 2, Shinohara et al. show three host computers. In FIGs. 3, 4, and 5, Shinohara et al. show each of those three host computers assigned to either host group 0 or host group 1. In contrast, Burton et al. teach that “a host can be in zero or more cluster groups.” Col. 4 at Lines 65-66 (emphasis added).

Neither Shinohara et al. nor Burton et al., singly or in combination, teach or suggest providing a plurality of host computers, assigning each of the plurality of host computers to one of (N) host computer groups, providing a plurality of logical volumes, forming (N) logical volume groups, wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited by Appellants’ claims 18 and 19.

For the reasons set forth above, Shinohara et al. teaches away from Appellants' claims 18 and 19 because Shinohara et al. teach that each logical volumes is assigned to some logical volume group. Burton et al. teaches away from Appellants' claims 18 and 19 because Burton et al. teach that a host computer need not be assigned to any host computer group.

Appellants respectfully submit that claims 18 and 19 are patentable over the combined teachings of Shinohara et al., Krehbiel et al., and Burton et al.

V. THE EXAMINER IMPROPERLY REJECTS CLAIMS 21-26, UNDER 35 USC § 103(a) AS BEING UNPATENTABLE OVER SHINOHARA ET AL. IN VIEW OF KREHBIEL ET AL.

A. *The Combined Teachings Of Shinohara Et Al. And Krehbiel Et Al. Fail To Teach Or Suggest All The Elements Of Appellants' Claim 21*

Shinohara et al. teach a resources management program on a computer network having a plurality of storage systems of different types, where that program converts a resources allocation request into a setup request appropriate to the network or storage system. Col. 2 at Lines 10-15. Shinohara et al. nowhere teach a computer program product comprising computer readable program code which causes a programmable computer processor to implement a method, wherein the method comprises providing a plurality of logical volumes, forming by a storage system owner (N) logical volume groups, assigning one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited by Appellants' claim 21. The Examiner acknowledges that "Shinohara fails to teach leaving logical volumes unassigned from the logical volume groups." August 9, 2007 Office Action at Page 4.

Krehbiel et al. fail to cure the deficiencies of Shinohara et al. Krehbiel et al. teach a

data processing system that comprises multiple primary storage devices, and at least one unused, unassigned storage device. Paragraph [0021]. If one of the primary storage devices fails, then an unassigned storage device is selected as a replacement drive for the failed storage device. Paragraph [0021].

Krehbiel et al. nowhere even mentions forming logical volume groups or host computer groups. This being the case, Krehbiel et al. nowhere teach a computer program product comprising computer readable program code which causes a programmable computer processor to implement a method, wherein the method comprises providing a plurality of logical volumes, forming by a storage system owner (N) logical volume groups, assigning one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), and where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited by Appellants' claim 21.

In *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 167 L. Ed. 2d 705 (2007), the Supreme Court held that the obviousness analysis of *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966), controls an obviousness inquiry. The *Graham* obviousness factors include "the scope and content of the prior art" and the "differences between the prior art and the claims". *KSR*, 127 S. Ct. at 1734 (quoting *Graham*, 383 U.S. at 17-18).

Shinohara et al. and Krehbiel et al., singly or in combination, fail to teach a computer program product comprising computer readable program code which causes a programmable computer processor to implement a method, where that method comprises providing a plurality of logical volumes, forming by a storage system owner (N) logical volume groups, assigning

one or more of the plurality of logical volumes to the (i)th logical volume group, where (i) is greater than or equal to 1 and less than or equal to (N), and where any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants' claim 21.

Shinohara et al. actually teach away from the Appellants' claim 21. "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); see *KSR*, 127 S. Ct. at 1739-40 (explaining that when the prior art teaches away from a combination, that combination is more likely to be nonobvious).

Shinohara et al. teach a computer program to implementing a method, where the method provides a plurality of logical volumes and assigns each logical volumes to some logical volume group. For example, in FIG. 2 Shinohara et al. teach a system comprising four logical volumes, including logical volumes LV0 and LV1 in storage system 0, wherein those logical volumes are designed LV00 and LV01 in FIG. 6, and logical volumes LV0 and LV1 in storage system 1, wherein in FIG. 6 those logical volumes are designated LV10 and LV11.

In FIG. 6, Shinohara et al. teach assigning logical volumes LV00, LV01, and LV10 to Logical Volume Group 0, and assigning logical volume LV11 to Logical Volume Group 1. Shinohara et al. nowhere teach or suggest a method which provides a plurality of logical volumes, and (N) logical volume groups, wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants' claim 21.

One of ordinary skill in the art following the teachings of Shinohara et al. would be

motivated to provide a plurality of logical volumes, and assign each of those logical volumes to some logical volume group. On the other hand, one of ordinary skill in the art following the teachings of Shinohara et al. would find no motivation to provide a plurality of logical volumes and (N) logical volume groups, wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned, as recited in Appellants' claim 21.

Appellants respectfully submit claim 21 is patentable over the combined teachings of Shinohara et al. and Krehbiel et al.

B. The Combined Teachings Of Shinohara Et Al. And Krehbiel Et Al. Fail To Teach Or Suggest All The Elements Of Appellants' Claims 22-26

Claims 22-26 depend, directly or indirectly, from claim 21. Under 35 U.S.C. § 112, fourth paragraph, "a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers." "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988). Appellants respectfully submit that claims 22-26 are patentable over the combined teachings of Shinohara et al. and Krehbiel et al.

CONCLUSION

In view of the foregoing, Appellants respectfully request that the Examiner's rejection of the subject application be reversed in all respects.

Respectfully submitted,

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CLAIMS APPENDIX A

1. A method to control access to logical volumes disposed in an information storage and retrieval system, comprising the steps of:

providing an information storage and retrieval system comprising a plurality of logical volumes, wherein said information storage and retrieval system is owned by a storage system owner;

providing a plurality of host computers, wherein each of said plurality of host computers is capable of communicating with said information storage and retrieval system, wherein at least two of said plurality of host computers are owned by different host computer owners, and wherein those different host computer owners differ from said storage system owner;

forming by said storage system owner (N) host computer groups, wherein (N) is greater than or equal to 1;

assigning by said storage system owner each of said plurality of host computers to one of the (N) host computer groups;

forming by said storage system owner (N) logical volume groups;

assigning by said storage system owner one or more of said plurality of logical volumes to the (i)th logical volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N), and wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned;

maintaining a database associating the (i)th host computer group with the (i)th logical volume group;

permitting each of said one or more host computers assigned to the (i)th host

computer group to access each logical volume comprising said (i)th logical volume group;

wherein each of said plurality of host computers assigned to (i)th host computer group is not assigned to any other of the (N) host computer groups, and wherein each of said logical volumes assigned to the (i)th logical volume group is not assigned to any other of the (N) logical volume groups.

2. The method of claim 1, wherein one or more of said (N) host computer groups are owned by a first person, and wherein one or more of said (N) host computer groups are owned by a second person, wherein said first person differs from said second person.

3. The method of claim 1, further comprising the step of providing a storage area network, wherein said storage area network is capable of communicating with said information storage and retrieval system and with each of said plurality of host computers.

4. The method of claim 1, further comprising the steps of:
forming a plurality of unique identifiers;
assigning a different one of said plurality of unique identifiers to each of said plurality of host computers;
associating in said database each of said plurality of unique identifiers with one of said (N) host computer groups.

5. The method of claim 4, further comprising the steps of:
requesting by one of said plurality of host computers to access a designated logical volume;

determining that said requesting host computer is assigned to the (j)th host computer group, wherein (j) is greater than or equal to 1 and less than or equal to (N);

determining if said designated logical volume is assigned to the (j)th logical volume group;

operative if said designated logical volume is assigned to the (j)th logical volume group, permitting said requesting host to access said designated volume;

operative if said designated logical volume is not assigned to the (j)th logical volume group, denying said requesting host access to said designated volume.

6. The method of claim 5, further comprising the steps of:

establishing the unique identifier assigned to said requesting host computer;

determining that the requesting host computer is assigned to the (j)th logical volume group.

7. The method of claim 1, further comprising the steps of:

receiving a request to assign one or more host computers to the (k)th logical volume group, wherein (k) is greater than or equal to 1 and less than or equal to (N);

assigning said one or more host computers to the (k)th logical volume group.

8. The method of claim 1, further comprising the steps of:

receiving a request to unassign one or more host computers from the (k)th logical volume group, wherein (k) is greater than or equal to 1 and less than or equal to (N);

unassigning said one or more host computers to the (k)th logical volume group.

9. The method of claim 1, further comprising the steps of:

receiving a request to unassign one or more logical volumes from the (k)th logical volume group, wherein (k) is greater than or equal to 1 and less than or equal to (N);

unassigning said one or more logical volumes from the (k)th logical volume group.

10. The method of claim 1, further comprising the steps of:

receiving a request to assign one or more logical volumes to the (k)th logical volume group, wherein (k) is greater than or equal to 1 and less than or equal to (N);
assigning said one or more logical volumes to the (k)th logical volume group;
assigning identifiers to said one or more logical volumes newly-assigned to the (k)th logical volume group.

11. An information storage and retrieval system comprising a computer readable medium having computer readable program code disposed therein to control access to logical volumes disposed therein, wherein said information storage and retrieval system is owned by a storage system owner, wherein said information storage and retrieval system comprises a plurality of logical volumes, and wherein a plurality of host computers is capable of communicating with said information storage and retrieval system, wherein at least two of said plurality of host computers are owned by different host computer owners, and wherein those different host computer owners differ from said storage system owner, the computer readable program code comprising a series of computer readable program steps to effect:

forming (N) host computer groups, wherein (N) is greater than or equal to 1;

assigning each of said plurality of host computers to one of the (N) host computer groups;

forming (N) logical volume groups;

assigning one or more of said plurality of logical volumes to the (i)th logical

volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N)), and wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned;

maintaining a database associating the (i)th host computer group with the (i)th logical volume group;

permitting each of said one or more host computers assigned to the (i)th host computer group to access each logical volume comprising said (i)th logical volume group;

wherein each of said plurality of host computers assigned to (i)th host computer group is not assigned to any other of the (N) host computer groups, and wherein each of said logical volumes assigned to the (i)th logical volume group is not assigned to any other of the (N) logical volume groups.

12. The information storage and retrieval system of claim 11, wherein one or more of said (N) host computer groups are owned by a first person, and wherein one or more of said (N) host computer groups are owned by a second person, wherein said first person differs from said second person.

13. The information storage and retrieval system of claim 11, wherein a storage area network is capable of communicating with each of said plurality of host computers, said computer readable program code further comprising a series of computer readable program steps to effect receiving information from said storage area network.

14. The information storage and retrieval system of claim 11, said computer readable program code further comprising a series of computer readable program steps to effect:

forming a plurality of unique identifiers;

assigning a different one of said plurality of unique identifiers to each of said plurality of host computers;

associating in said database each of said plurality of unique identifiers with one of said (N) host computer groups.

15. The information storage and retrieval system of claim 14, said computer readable program code further comprising a series of computer readable program steps to effect:

receiving from one of said plurality of host computers a request to access a designated logical volume;

determining that said requesting host is assigned to the (j)th host computer group, wherein (j) is greater than or equal to 1 and less than or equal to (N);

determining if said designated logical volume is assigned to the (j)th logical volume group;

operative if said designated logical volume is assigned to the (j)th logical volume group, permitting said requesting host to access said designated volume;

operative if said designated logical volume is not assigned to the (j)th logical volume group, denying said requesting host access to said designated volume.

16. The information storage and retrieval system of claim 15, said computer readable program code further comprising a series of computer readable program steps to effect:

establishing the unique identifiers assigned to said requesting host computer;

determining using said database and said unique identifiers that the requesting

host computer is assigned to the (j)th logical volume group.

17. The information storage and retrieval system of 11, said computer readable program code further comprising a series of computer readable program steps to effect:

receiving a request to assign one or more host computers to the (k)th logical volume group, wherein (k) is greater than or equal to 1 and less than or equal to (N);

assigning said one or more host computers to the (k)th logical volume group.

18. The information storage and retrieval system of claim 11, said computer readable program code further comprising a series of computer readable program steps to effect:

receiving a request to unassign one or more host computers from the (k)th logical volume group, wherein (k) is greater than or equal to 1 and less than or equal to (N);

unassigning said one or more host computers to the (k)th logical volume group.

19. The information storage and retrieval system of claim 11, said computer readable program code further comprising a series of computer readable program steps to effect:

receiving a request to unassign one or more logical volumes from the (k)th logical volume group, wherein (k) is greater than or equal to 1 and less than or equal to (N);

unassigning said one or more logical volumes from the (k)th logical volume group.

20. The information storage and retrieval system of claim 11, said computer readable program code further comprising a series of computer readable program steps to effect:

receiving a request to assign one or more logical volumes to the (k)th logical volume group, wherein (k) is greater than or equal to 1 and less than or equal to (N);
assigning said one or more logical volumes to the (k)th logical volume group;
assigning identifiers to said one or more logical volumes newly-assigned to the (k)th logical volume group.

21. A computer program product embodied in an information storage medium, said computer program product being usable with a programmable computer processor to control access to logical volumes disposed in an information storage and retrieval system, wherein said information storage and retrieval system is owned by a storage system owner, wherein said information storage and retrieval system comprises a plurality of logical volumes, wherein a plurality of host computers is capable of communicating with said information storage and retrieval system, and wherein at least two of said plurality of host computers are owned by different host computer owners, and wherein those different host computer owners differ from said storage system owner, comprising:

computer readable program code which causes said programmable computer processor to form (N) host computer groups, wherein (N) is greater than or equal to 1;

computer readable program code which causes said programmable computer processor to assign each of said plurality of host computers to one of the (N) host computer groups;

computer readable program code which causes said programmable computer processor to form (N) logical volume groups;

computer readable program code which causes said programmable computer processor to assign one or more of said plurality of logical volumes to the (i)th logical

volume group, wherein (i) is greater than or equal to 1 and less than or equal to (N), wherein any logical volumes not assigned to any of the (N) logical volume groups remain unassigned;

computer readable program code which causes said programmable computer processor to maintaining a database associating the (i)th host computer group with the (i)th logical volume group;

computer readable program code which causes said programmable computer processor to permit each of said one or more host computers assigned to the (i)th host computer group to access each logical volume comprising said (i)th logical volume group.

22. The computer program product of claim 21 wherein one or more of said (N) host computer groups are owned by a first person, and wherein one or more of said (N) host computer groups are owned by a second person, wherein said first person differs from said second person.

23. The computer program product of claim 21 wherein a storage area network is capable of communicating with each of said plurality of host computers, further comprising computer readable program code which causes said programmable computer processor to receive information from said storage area network.

24. The computer program product of claim 21, further comprising:
computer readable program code which causes said programmable computer processor to form a plurality of unique identifiers;

computer readable program code which causes said programmable computer processor to assign a different one of said plurality of unique identifiers to each of said

plurality of host computers;

computer readable program code which causes said programmable computer processor to associate in said database each of said plurality of unique identifiers with one of said (N) host computer groups.

25. The computer program product of claim 21, further comprising:

computer readable program code which causes said programmable computer processor to receive from one of said plurality of host computers a request to access a designated logical volume;

computer readable program code which causes said programmable computer processor to determine that said requesting host is assigned to the (j)th host computer group, wherein (j) is greater than or equal to 1 and less than or equal to (N);

computer readable program code which causes said programmable computer processor to determine if said designated logical volume is assigned to the (j)th logical volume group;

computer readable program code which, if said designated logical volume is assigned to the (j)th logical volume group, causes said programmable computer processor to permit said requesting host to access said designated volume;

computer readable program code which, if said designated logical volume is not assigned to the (j)th logical volume group, causes said programmable computer processor to deny said requesting host access to said designated volume.

26. The computer program product of claim 25, further comprising:

computer readable program code which causes said programmable computer processor to establish the unique identifier assigned to said requesting host computer;

computer readable program code which causes said programmable computer processor to determine using database and said unique identifier that the requesting host computer is assigned to the (j)th logical volume group.

EVIDENCE APPENDIX B

NONE

RELATED PROCEEDINGS APPENDIX C

NONE